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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/530,365	07/13/2005	Yoshio Bando	2005-0516A	2995

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EXAMINER	
MASLOVA, OXANA	
ART UNIT	**PAPER NUMBER**
2859	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	12/26/2006	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/530,365	BANDO ET AL.	
	Examiner	Art Unit	
	Oxana Maslova	2859	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 July 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) *1-6 and 13-16* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *7-12 and 17-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *4/6/2005, 7/13/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-6 and 13-16, drawn to a product/temperature sensitive element, classified in class 374, subclass 201.

II. Claims 7-12 and 17-27, drawn to a process of making a temperature sensitive element, classified in class 423, subclass 439.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions II and I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make another and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)).

In this case, the product, i.e., temperature sensing element, can be made by another and materially different process, such as a process that does not require the step of vaporizing the mixture, or the step of causing the vapor to react at a temperature of 800 to 850° C.

3. Because these inventions are independent or distinct for the reasons given above and there would be a serious burden on the examiner if restriction is not required because the inventions have acquired a separate status in the art due to their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with Mrs. A. Pulliam, on November 1, 2006, a provisional election was made without traverse to prosecute the invention of Group II, claims 7-12 and 17-27.

Accordingly, claims 7-12 and 17-27 are further examined on the merits. Claims 1-6 and 13-16 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention due to their different classification.

Claim Rejections - 35 USC § 103 Page 3

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 7-12, 17-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Y.Gao et al,"Carbon nanothermometer containing gallium", Nature, Vol.45, page 599, February 7, 2002, (hereinafter Gao) in view of S.Boyer (1,793,303).

Gao discloses a process comprising the step of mixing gallium oxide powder and carbon powder (a homogeneous mixture of Ga2O3 and amorphous, active carbon (weight ratio 7.8:1) into a uniform state; the step of subjecting the mixed powder to heating treatment (at 1,360°C) under inert gas flow (nitrogen), and thus vaporizing the mixture; and the step of causing the vapor to react at a temperature of 800°C, wherein a vertical high frequency induction heating furnace is used to conduct the heating treatment.

Gao does not disclose the use of indium oxide powder.

Boyer discloses a temperature responsive device, which uses gallium or indium alone or n combination with other metals as temperature sensing materials (p.1, lines 28-37). Also, Boyer discloses that indium is an equivalent of gallium (p.2, lines 115-116).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use indium instead of gallium, as taught by Boyer, when making the oxide for the temperature sensitive composition disclosed by Gao, because Boyer has already indicated that both of these metals are equivalent materials which will perform the same functions of sensing higher temperatures, if one is replaced with the other.

Gao does not disclose that the heating treatment is conducted for one hour or more. This limitation (heating treatment conducted for one hour or more), absent any criticality, is only considered to be the "optimum" amount of time for conducting the heating treatment used by Gao, that a person having ordinary skill in the art at the time invention was made would have been able to determine using routine experimentation based, among other things, on the need to ensure a proper heating treatment, etc. See In re Boesch 205 USPQ 215 (CCPA 1980).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to choose one hour or more as the time of the heating treatment required by Gao, in order to provide a proper heating treatment for producing a temperature sensitive element.

With respect to claims 7-12 and 17-27, the limitations of claims 1-6 and 13-16 (which claims 7-12 and 17-27 depend from) incorporated in claims 7-12 and 17-27 do not provide enough patentable weight because they are directed to structural features (a temperature sensitive

element) of the invention without affecting the process (process of producing a temperature sensitive element) in a manipulative sense. See Ex-parte Pfeiffer, 1962 C.D. 408 (1961) where the court held that in order to be entitled to weight in method claims, the recited structure limitations must affect the method in a manipulative sense.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art cited in the PTO-892 and not mentioned above disclose related devices and methods. Wang et al (US 2003/0119920) discloses CNT containing catalysts, method of making, and nanotube catalysts, Jin et al (US 6,250,984) discloses article comprising enhanced nanotube emitter structure and process for fabricating article, Fisher et al (US 6,203,814) discloses method of making functionalized nanotubes, Smalley et al (US 2005/0249656) discloses method for forming a patterned array of single-wall carbon nanotubes, Speckbrock et al (US 6,019,509) discloses low melting gallium, indium, and tin alloys, and thermometers employing same, Nakayama et al (US 2003/0109382) discloses method for manufacturing indium-tin-iron catalyst for use in production of carbon nanocoils.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Oxana Maslova whose telephone number is 571/ 272-6532. The examiner can normally be reached on 8:30 to 5:00 ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez can be reached on 571/ 272-2245. The fax phone number for the organization where this application or proceeding is assigned is 571/273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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December 13, 2006

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